

## HOW TO KEEP WELL IN WINTER

Sickness Ought Not to Be More Common Than in Warmer Season

There is no necessity for the vast amount of illness during the winter. It is true that in this season the wear and tear upon the body is greater than in summer, but this only means that greater care is necessary to keep the body in good condition. The two most important requisites to winter health are proper food supply, and fresh air.

A proper food supply is the body's first defence against disease; it is the first essential to winter health. To keep the body warm during the winter, it is necessary to eat more food than in summer. But care should be taken not to overeat. Most persons in winter eat more than they can digest and use. Our foods should be prepared so as to be easily digested. Rich foods and fried foods over work the organs of digestion and in the end furnish the body but little food. Two ounces of flour in the form of hard toast will give the stomach half the work and the body twice the nourishment that is given by the same amount of flour made up into hot cakes.

The abuse of the stomach and the late hours incident to the holidays are responsible for much winter disease. Statistics show that there is more sickness during the first twenty days of January than at any other time of the year. During this period following the holidays there are more deaths from pneumonia than usual, and epidemics of colds and grippe are far more prevalent. During the holiday season many persons whose disease-resisting power is low lay the groundwork for ill health the remainder of the winter.

The second essential to winter health is fresh air. During the winter we need even more fresh air than during the summer; most of us get much less. Pneumonia, colds, sore throat and all other disease of the air passages are almost unknown except during the winter, when people get too little fresh air. During the day there should be some ventilation in our offices and houses. During the night there should be a half-sash opening to the out-doors. —Dr. Daniels.

### Forest Notes.

The American forestry association has members in every state in the union, in every province in Canada, and in every civilized and semi-civilized country in the world.

Makers of phonographs are aiming to use wood instead of metal in all parts of the instrument where this is possible, in order to increase the mellowness of the tone.

On the Pocatello forest, Idaho, 230,000 trees were planted during the past year, and almost half a million in the past three years, fully three-fourths of which are alive and doing well.

Experiments in the use of aspen for shingles show that the shingles do not check in seasoning, and that they turn water satisfactorily, but that they are too easily broken in handling.

There are somewhat more than 500 recognized tree species in the United States, of which about 100 are commercially important for timber. Of the 500 recognized species, 300 are represented in the government's newly acquired Appalachian forests. All American species, except a very few subtropical ones on the Florida keys and in extreme southern Texas, are to be found in one or another of the national forests.

## HOME COURSE IN SCIENTIFIC AGRICULTURE

### FIFTEENTH ARTICLE. THE PROPAGATION OF PLANTS.

By L. C. CORBETT, Horticulturist, Bureau of Plant Industry, United States Department of Agriculture.

**I**N addition to using the natural means of reproduction of plants by seeds, bulbs, etc., man has developed several artificial ways, of which the principal are cuttings, layering, grafting and budding.

A cutting is a detached portion of a plant inserted in soil or in water for the purpose of producing a new plant. This method of propagation is considered most important. The most common form of hardwood cuttings consists of a straight portion of a shoot or cane nearly uniform in size throughout and containing two or more buds. At the lower end it is usually cut off just below a bud, because roots develop most readily from the joints. At the top it is usually cut off some distance above the highest bud. A heel cutting consists of the lower portion of a branch, containing two or more buds, cut off in such a manner as to carry with it a small portion of that branch forming the so-called "heel." A mallet cutting is produced by severing the parent branch above and below a shoot, so as to leave a section of it on the base of the cutting. The principal advantage



Photo by Long Island agricultural experiment station.

DWARF BARTLETT PEAR GROWN ON QUINCE STOCK.

In the use of heel and mallet cuttings lies in the greater certainty of developing roots. The principal drawback is that only one cutting can be made from each lateral branch.

When it is desired to make the largest number of cuttings from a limited supply of stock, cuttings are made containing but one bud each. Such cuttings are commonly started under glass with bottom heat either in greenhouse or hotbed.

Cuttings are usually made with two or more buds. The cuttings are made while the wood is dormant during the fall or early winter. As fast as made they are tied in bundles of twenty-five or fifty (butts all one way) and buried bottom end up in a trench and covered to a depth of two or three inches with sand or mellow soil. Cuttings may also be kept over winter in a cool cellar buried in sand, sawdust or moss.

The following spring cuttings are set about three inches apart in a trench with only the topmost bud or buds above the surface. The soil is then replaced in the trench and thoroughly packed. In planting, the cuttings should be exposed to light and air as little as possible. After being planted the cutting should develop roots and put forth leaves, and by the next fall or spring it should be ready to put out. Herbaceous or soft wood cuttings are exemplified in the "slips" used to increase the numbers of house plants. This method of propagation can be employed in the winter time under glass. Herbaceous cuttings may be made from the leaf or stem.

Leaf cuttings are commonly employed in multiplying plants having thick, fleshy leaves containing a large quantity of plant food either in the body of the leaf or its larger ribs. As a general rule, in preparing slips the leaf area should be reduced to a minimum in order to lessen evaporation.

Usually an inch of broken stone or coarse gravel overlaid with one and one-half to three inches of sand will be found ample for all soft wood cuttings.

Short cuttings of the roots may be used in the propagation of many plants, especially those which show a natural tendency to sucker. A layer is a branch so placed in contact with the earth as to induce it to throw out roots and shoots. Layering frequently proves a satisfactory method with woody plants which do not readily take root from cuttings. All the common pomeaceous fruits, the stone fruits and the citrus fruits

are now multiplied by grafting or budding. A scion is a portion cut from a plant to be inserted upon another of the same plant, with the intention that it shall grow. Except for herbaceous grafting the wood for scions should be taken while in a dormant or resting condition. The time usually considered best is after the leaves have fallen, but before severe freezing begins. The scions are tied in bunches and buried in moist sand, where they will not freeze and yet will be kept cold enough to prevent growth. Good results often follow cutting scions in the spring just before or at the time the grafting is to be done. If cleft grafting is the style to be employed this practice frequently gives good results, but spring cutting of scions for whip grafting is not desirable.

The stock is the plant or part of a plant upon which or into which the bud or scion is inserted. For best results in grafting it is essential that the stock be in an active condition.

Cleft grafting is particularly adapted to large trees when for any reason it becomes necessary to change the variety. Branches too large to be worked by other methods can be cleft grafted. A branch one or one and one-half inches in diameter is severed with a saw. Care should be taken that the bark be not loosened from any portion of the stub. Split the exposed end with a broad thin chisel or grafting tool. Then with a wedge or the wedge shaped prong at the end of the grafting tool spread the cleft so that the scions may be inserted.

The scion should consist of a portion of the previous season's growth and should be long enough to have two or three buds. The lower end of the scion which is to be inserted into the cleft should be cut into the shape of a wedge, having the outer edge thicker than the other. In general it is a good plan to cut the scion so that the lowest bud will come just at the top of this wedge, so that it will be near the top of the stock. To make this contact of the growing portions doubly certain the scion is often set at a slight angle with the stock into which it is inserted.

After the scions have been set the operation of cleft grafting is completed by covering all cut surfaces with a layer of grafting wax.

Whip grafting is almost universally used in root grafting. It has the advantage of being well adapted to small plants only one or two years of age, and it can be done indoors during the comparative leisure of winter.

The graft is made by cutting the stock off diagonally—one long smooth cut with a sharp knife, leaving about three-fourths of an inch of cut surface. Place the knife about one-third of the distance from the end of the cut surface at right angles to the cut and split the stock in the direction of its long axis. Cut the lower end of the scion in like manner, and when the two parts are forced together the cut surfaces will fit neatly together, and one will nearly cover the other if scion and stock are of the same size. A difference may be disregarded unless it be too great. After the scion and stock have been locked together they should be wrapped with five or six turns of waxed cotton to hold the parts firmly together. It is in root grafting that the whip graft finds its distinctive field.

The roots are dug and the scions are cut in the fall and stored. The work of grafting may be done during the winter months. When the operation has been performed the grafts are packed away in moss, sawdust or sand in a cool cellar to remain until spring.

In ordinary propagation by means of whip grafts the scion is cut with about three buds, and the stock is nearly as long as the scion. The graft is so planted as to bring the union of stock and scion not very far below the surface of the ground. But where the trees are required to be especially hardy in order to stand severe winters and the roots used are not known to be so hardy as the plants from which the scions have been cut a different plan is adopted. The scions are cut much longer, and the roots may be cut shorter, and the graft is planted so deep as to cause roots to issue from the lower end of the scion. When taken up to be set in the orchard the original root may be removed entirely.

Budding is one of the most economical forms of artificial reproduction, and each year witnesses its more general use.

The operation of budding is simple and can be done with great speed by expert budders. The work has usually to be done in July, August or early September. The bud should be taken from wood of the present season's growth. Since the work of budding is done during the season of active growth the bud sticks are prepared so that the petiole or stem of each leaf is left attached to serve as a handle to aid in pushing the bud home when inserting it beneath the bark of the stock. This is what is usually called a shield bud and is cut so that a small portion of the woody tissue of the branch is removed with the bud.

The stock for budding should be at least as thick as the ordinary lead pencil. The height at which buds are inserted varies; the nearer the ground the better. When the bud is made a ligature is then tightly drawn about, above and below the bud to hold it in place until a union shall be formed. Bands of raffia about eight or ten inches long make a most convenient tying material. As soon as the buds have been grafted with the stock the ligature should be cut in order to prevent girdling the stock. This done, the operation is complete until the following spring, when all the trees in which the buds have "taken" should have the top cut off just above the bud.

The one objection to budding is that it causes an unsightly crook in the body of the tree unless the tree is planted deep in the orchard.

### Notice to Water Users

State Engineer's Office, Salt Lake City, Utah, Dec. 15, 1913.

Notice is hereby given that Edith W. Gregory, whose post office address is Cedar City, Utah, has made application in accordance with the requirements of the Compiled Laws of Utah, 1907, as amended by the Session Laws of Utah, 1909 and 1911, to appropriate six-hundredths (.06) of a cubic foot of water per second from an unnamed spring in Iron County, Utah. Said spring is situated at a point which lies 3,960 feet south and 2,640 feet east of the northwest corner of Section 1 Township 35 south, Range 10 west, Salt Lake base and meridian. The water will be diverted at the place where it issues from said spring and conveyed by means of a pipe line for a distance of approximately 3,960 feet, and there used from January 1 to December 31, inclusive, of each year, for stock watering purposes. This application is designated in the State Engineer's office as No. 5408.

All protests against the granting of said application, stating the reasons therefor, must be made by affidavit in duplicate and filed in this office within thirty (30) days after the completion of the publication of this notice.

W. D. BEERS, State Engineer.  
Date of first publication Dec. 26, 1913.  
Date of last publication Jan. 26, 1914.

### Notice for Publication

(Publisher.)

Department of the Interior, U. S. Land Office at Salt Lake City, Utah, December 23, 1913.

Notice is hereby given that Rachel H. Cotton, of St. George, Utah, who, on January 29, 1910, made Desert Land Entry, Serial No. 05435, for SE $\frac{1}{4}$  and SW $\frac{1}{4}$  of NE $\frac{1}{4}$ , Section 34, Township 36 South, Range 16 West, Salt Lake Meridian, has filed notice of intention to make Final Desert Land Proof, to establish claim to the Land above described, before the Clerk of the District Court, at St. George, Utah, on the 11th day of February, 1914.

Claimant names as witnesses: James E. Baruum, Ernest Barlocher, Iver Grove, George A. Holt, all of Enterprise, Utah.

E. D. R. THOMPSON, Register.  
First pub. Jan. 2 last pub. Jan. 30

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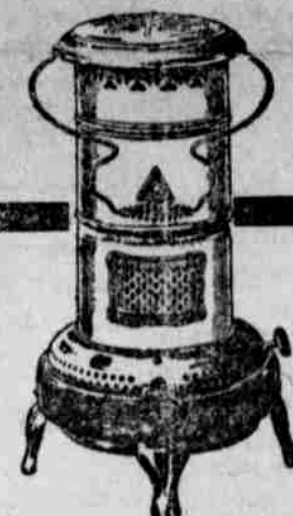


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